

Replication

Bug 1: Incorrect calculation of fines.

Case 1: When a loan becomes overdue by 1 day no fine is imposed.

Scenario 1: In this scenario the book is overdue by 1 day but the fine is still 0 as seen in the screenshot below.

```
Choice : r
Return Book Use Case UI
01/11/2020

Scan Book (<enter> completes): 2
Inspecting
Book: 2
  Title: celtics
  Author: rajon rondo
  CallNo: 123
  State: ON_LOAN
Loan: 9
  Borrower 2 : Ralph, Lauren
  Book 2 : celtics
  DueDate: 31/10/2020
  State: OVER_DUE

Overdue fine : $0.00
```

Scenario 2: In this scenario the book is supposed to be returned by 30th but returning it on 31st does not incur any fine as shown in the figure below

```
Choice : r
Return Book Use Case UI
31/10/2020

Scan Book (<enter> completes): 2
Inspecting
Book: 2
  Title: celtics
  Author: rajon rondo
  CallNo: 123
  State: ON_LOAN
Loan: 13
  Borrower 1 : Doe, John
  Book 2 : celtics
  DueDate: 30/10/2020
  State: OVER_DUE

Overdue fine : $0.00
```

Bug 2: Incorrect fine amount levied.

When a fine is incurred, the amount of fine reported is half the amount intended.

Scenario 1: The book is overdue by 2 days but the fine amounts to 1 which is half the correct amount

```
Choice : r
Return Book Use Case UI
27/10/2020

Scan Book (<enter> completes): 1
Inspecting
Book: 1
  Title: t
  Author: a
  CallNo: c1
  State: ON_LOAN
Loan: 10
  Borrower 1 : t, j
  Book 1 : t
  DueDate: 25/10/2020
  State: OVER_DUE

Overdue fine : $1.00
Is book damaged? (Y/N): n
Return processing complete
```

Scenario 2: The book is overdue by 6 days and the overdue fine is 3 which is half of the total amount that is supposed to be charged.

```
Choice : r
Return Book Use Case UI
28/10/2020

Scan Book (<enter> completes): 2
Inspecting
Book: 2
  Title: celtics
  Author: rajon rondo
  CallNo: 123
  State: ON_LOAN
Loan: 12
  Borrower 2 : Ralph, Lauren
  Book 2 : celtics
  DueDate: 22/10/2020
  State: OVER_DUE

Overdue fine : $3.00
Is book damaged? (Y/N): n
Return processing complete
```

Bug 3: Incorrect state of a loan

adjusting the date forward then backwards does not fix the state of a loan

Scenario 1:

A loan is borrowed with a due date of 22.

```
Choice : 11

Loan: 14
  Borrower 1 : Doe, John
  Book 2 : celtics
  DueDate: 22/10/2020
  State: CURRENT

20/10/2020
```

The date is adjusted forward by 5 days making the loan overdue by 3 days as shown below:

```
Choice : t
Enter number of days: 5
25/10/2020

25/10/2020
```

When the loan is displayed its overdue.

```
Choice : 11

Loan: 14
  Borrower 1 : Doe, John
  Book 2 : celtics
  DueDate: 22/10/2020
  State: OVER_DUE

25/10/2020
```

Adjusting the date backwards with 5 days returns the date to the original date meaning the loan should not be overdue.

```
Choice : 1
Enter number of days: -5
20/10/2020

20/10/2020
```

When the loan is displayed it shows its overdue which is not true as the overdue date is greater than date shown.

```
Choice : 11

Loan: 14
  Borrower 1 : Doe, John
  Book 2 : celtics
  DueDate: 22/10/2020
  State: OVER_DUE

20/10/2020
```

Scenario2 : Following the steps of adjusting the date forward and backwards the state of the loan is overdue as seen in this screenshot where the current date is 25 but the due date is 27 but still the state is overdue.

```
Choice : 11

Loan: 16
  Borrower 2 : Ralph, Lauren
  Book 3 : Heat
  DueDate: 27/10/2020
  State: OVER_DUE

25/10/2020
```

Bug 4: Incorrect patron status

Status of a patron changes to CAN_BORROW after paying an amount less than the specified fine.

Scenario 1: If the patron pays a loan and remains with a balance of 1 the patron status is changed to CAN_BORROW.

In the screenshot below, the patron returns an overdue loan and has a fine of \$4.

```
Patron: 2
Name: Ralph, Lauren
Email: ralph@mail.com
Phone: 12345
Fines Owed : $4.00
State: RESTRICTED
```

When 3 of the 4 dollars are paid, thus a balance of 1 remains but the status is still changed to CAN_BORROW.

```
Choice : p
Pay Fine Use Case UI

Swipe patron card (press <enter> to cancel): 2
Patron: 2
Name: Ralph, Lauren
Email: ralph@mail.com
Phone: 12345
Fines Owed : $4.00
State: RESTRICTED

Enter amount (<Enter> cancels) : 3
Patron: 2
Name: Ralph, Lauren
Email: ralph@mail.com
Phone: 12345
Fines Owed : $1.00
State: CAN_BORROW

Pay Fine process complete
```

Bug 5: Negative fine amount

Adjusting the date forward and then backwards results to a negative fine amount for an overdue loan.

Scenario 1: In this scenario the due date is 22 but the date is adjusted from 20 to 25 and then back to 20. When returning the loan, the fine is negative.

```
Choice : r
Return Book Use Case UI
20/10/2020

Scan Book (<enter> completes): 2
Inspecting
Book: 2
  Title: celtics
  Author: rajon rondo
  CallNo: 123
  State: ON_LOAN
Loan: 14
  Borrower 1 : Doe, John
  Book 2 : celtics
  DueDate: 22/10/2020
  State: OVER_DUE

Overdue fine : $-1.00
Is book damaged? (Y/N): |
```

When paying for the fine, the fine is still negative and the status of the patron is CAN_BORROW.

```
Choice : lm

Patron: 1
  Name: Doe, John
  Email: johnDoe@mail.com
  Phone: 12345
  Fines Owed : $-2.00
  State: CAN_BORROW
```